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Instructor-learner Interaction: Pre- and Post-interaction in an IS Technical Course

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Abstract:

In this paper, we discuss how instructors can use collaboration software to facilitate post- and pre- learner-instructor interactions in online learning environments. These interactions are a vital part of teaching and often overlooked yet critical to student success. The coronavirus disease of 2019 (COVID-19) pandemic forced many colleges to swiftly transition their face-to-face (F2F) classes to some form of hybrid modes to integrate synchronous and asynchronous course delivery. The lack of physical and social presence in online learning environments makes it challenging for instructors to use pre- and post- instructor-learner interactions to engage students and provide immediate feedback. In this practice paper, we contribute to teaching in a synchronous online learning environment by demonstrating how instructors can leverage collaboration software to simulate F2F instructor-learner interactions.

Keywords: IS Pedagogy, Instructor-Learner, Instructor-Presence, COVID-19.

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1 Introduction

Positive learning outcomes require learner engagement (Moore, 2012; Shelton, Hung, & Lowenthal, 2017; Kurucay & Inan, 2017; Bolliger & Halupa, 2018). Learners interact with the learning environment by engaging with other learners, the content, and instructors. The prior literature identifies three levels of learner interactions: 1) instructor-learner, 2) learner-learner, and 3) learner-content (Tawfik et al., 2017; Kyei-Blankson, Ntuli, & Donnelly, 2019). These interactions foster positive learning outcomes and learner satisfaction. In this paper, we focus on how computer-mediated technology can facilitate instructor-learner interaction to support pre- and post- interactions in an online course. We consider an IS technical course as the context for this paper.

Instructor-learner interaction plays a vital role in students' learning and success, and it has more salience in technical courses that require hands-on activities. Learners in technical courses often rely on hands-on activities to practice and master course concepts. For example, technical courses, such as data analytics and visualization, require extensive practice with tools such as Tableau, R, or PowerBI and instructor guidance on how to use these tools effectively.

In technical courses that require extensive hands-on activities, positive learning outcomes require instructor-learner interaction. Instructors' presence in a classroom provides personal and emotional connections and helps students to develop critical-thinking skills (Stavredes, 2011). The instructor-learner interaction and those interactions' content shape the instructor's presence. Stavredes (2011) emphasizes the vital need for student persistence: learners' ability to develop a relationship with the faculty to feel connected.

Instructor-learner interaction's benefits include increased learning, satisfaction, motivation, and achievement among students in the online course (LaBarbera, 2013; Kuo, Walker, Schroder, & Belland, 2014; Khalid & Quick, 2016; Kyei-Blankson et al., 2019; Mehall, 2020). In this paper, we focus on pre- and post-class instructor-learner interactions. Pre- and post-class interactions are integral to students learning and persistence in a course (e.g., Stavredes, 2011; Gilpin, 2020; Mehall, 2020). These interactions are an essential part of teaching and often overlooked yet critical to student success, especially in technical courses that require extensive hands-on activities.

For example, in a F2F classroom environment, students often arrive five to ten minutes before the class starts to ask quick questions about the course material to, for example, reaffirm thoughts about an assignment or to chat about a topic of their interest. These same interactions may occur after a classroom session. Students and instructors do not plan these interactions, and they rarely last that long. Nevertheless, these pre- and post- interactions may determine the tone of the class and how instructors deliver content.

As Berge (1999 p. 8) notes, "When students have the opportunity to interact with their instructors about the content, they have the opportunity to build within themselves, and to communicate, a shared meaning to 'make sense' of what they are learning". Moreover, informal learning via unplanned interaction can lead to learning stimulation (Mehall, 2020). Consequently, computer-mediated collaborative technology plays an essential role in pre- and post-class interactions. In this paper, we provide viewpoints on how instructors can leverage some advances in collaboration software to facilitate pre- and post- instructor-learner interactions in an online learning environment.

2 F2F: Pre- and Post- Instructor-learner Interaction

We consider a graduate course called Data Analytics for Decisions in which students focus on exploring and using analytical tools, techniques, and models to solve business problems. The course relies on various analytics tools to demonstrate and apply data mining and analytics concepts. Its design focuses on enabling learners to master analytic tools such as R and R-Studio, SAS Miner and Guide, Excel, and Tableau to explore unstructured and structured data.

The course uses active learning techniques to encourage deep learning. The instructor facilitates mini-lectures to create and assist the student in understanding, evaluating, and applying analytic concepts. The course also uses case studies to bring real-world and practical applications to help students better understand the course topics.

Instructors expect students to serve as discussion leaders once or twice during the semester. As a discussion leader, students select a topic from the course schedule and prepare a set of intended

questions for the instructor's approval. Instructors present problem-solving demonstrations using various analytics techniques such as T-test, linear regression, decision trees, sentiment analysis, Web data scraping, data visualization, and cluster analysis. After the instructor's demo, each learner completes a hands-on exercise independently. Once all students complete their hands-on exercises, the instructor presents the solution and addresses students' additional questions.

The instructors rely significantly on pre- and post-class interactions as students typically come to class earlier to discuss their learning experience with the instructor. Learning to use the various tools at home on personal computers can be challenging for some learners. Thus, many learners prefer to engage instructors one on one to explain their unique experiences and get feedback. Often, the tone of the class and some of the focal points of discussion depends on the outcome of the pre-class instructor-learner interactions.

Post-class interactions become meaningful because they enable the instructor to assess learners' knowledge about the tools and course content. These interactions can reveal hidden challenges or opportunities. In the F2F learning environment, these pre- and post- instructor-learner interactions have a social and physical presence. Thus, students and instructors can use verbal and non-verbal communication during these interactions. As the course transitioned to an online learning environment due to the coronavirus disease of 2019 (COVID-19) pandemic, instructors adjusted to facilitate pre- and post-class instructor-learner interaction to engage students in the pre-COVID-19 F2F class.

Advances in collaboration software can help instructors create an active learning environment with pre- and post-class instructor-learner interaction. Most collaboration software has rich and robust features that allow instructors to blend asynchronous (messaging, content, scheduling, recording) and synchronous (voice, audio, screen sharing) for classroom activities. In Section 3, we describe how we used collaboration software to facilitate pre- and post- instructor-learner interaction in the online learning environment.

3 Online: Pre- and Post-class Instructor-learner Interaction

Educators can use several collaborative tools to facilitate synchronous sessions with learners. According to Fasciani, Eagle, and Preset (2019), some popular collaborative tools include Zoom, Google Hangouts, BigBluebutton, and BlueJeans. These collaborative technologies typically operate over the Web and have a desktop client and mobile app that allows one to meet with or without video. They also commonly include additional functionality such as rich meeting features and reliable service, interactive tools for communications, and screen sharing. Instructors can leverage these functionalities to engage students and simulate pre- and post-class instructor-learner interaction in synchronous classes.

When implementing pre- and post- classroom interactions in the online environments, we recommend that instructors keep the same schedule as the F2F course. Announce to the learners that the virtual classroom will be open 10 to 15 minutes prior and after class for questions. This time should not comprise regularly scheduled office hours. The social presence engages learners and cohesively merges with teaching presence to create greater engagement with goals and direction. Social presence can be strengthened when instructors and students interact in meaningful and consistent ways in the online classroom environment (Shelton et al., 2017)

In collaborative software, an instructor or a learner can initiate a private chat. These private chats provide learners and instructors opportunities to interact on a one-to-one basis. Students can seek guidance and direction privately from instructors in the chat room before and after class. Despite the physical distance and lack of social presence, the chats occur in real time, and instructors can provide immediate feedback. Furthermore, students can save these chats into a file that they can reference later, which they cannot do in F2F class pre- or post-class instructor-learner interaction.

For example, suppose a student had a problem using a tool, such as SAS Enterprise Miner. In that case, the student can use the private chat to seek guidance and direction, and the student can review the dialogues in the saved chats later when a problem arises. Although the pandemic forced the class to go online using synchronous delivery, the private chat feature enabled instructors to engage learners on a one-to-one basis and overcome some challenges that arose due to the lack of social and physical presence. Breakout rooms are another feature of collaboration software that can help instructors overcome the lack of physical and social presence. Instructors can use the breakout room to engage

students in a one-on-one or a group of students before and after class. These breakout rooms enable learners to share their experiences with the instructor and seek feedback.

We used the breakout rooms to provide advice and guidance on how to perform a task on a tool, such as Tableau. Breakout rooms also allow one to share screens. Thus, learners can share their screen with the instructor and recreate a scenario for the instructor. The screen sharing feature enables the instructor to see exactly what the learners' concerns are and then make suggestions and recommendations to address them. The breakout rooms and the ability to share screens synchronously enable instructors and learners to overcome the lack of physical and social presence and facilitate instructor-learner interaction in the synchronous class environment.

The sudden shift to an online environment proved distressing for students and challenging for instructors. Nevertheless, instructors can simulate F2F experiences in an online learning environment to support positive learning outcomes. Fostering an interactive environment that encourages students to participate involves establishing expectations, planning, and technology availability.

4 Conclusions and Lesson Learned

Many instructors may not realize the benefits of pre- and post- learner interactions in creating a positive learning experience. Often, these interactions are informal, unplanned, brief, and taken for granted in F2F classes. In technical courses, students need these interactions to share their challenges and "aha!" moments with instructors. The immediate feedback from instructor-learner interactions can boost learners' confidence to persist and successfully meet the learning goals for the course. Moreover, it provides insights into the challenges and opportunities learners face in mastering the content and how instructors can guide and direct the learners and deliver content to achieve learning goals.

As instructors for the data analytics class, we did not immediately appreciate the role of pre- and post- instructor-learner interaction until the COVID-19 pandemic and our F2F classes transitioned to the synchronous online delivery mode. In a synchronous online class, the instructor still has a regular class schedule; however, learning management systems and collaboration software do not have built-in features to simulate pre- and post- instructor-learner interactions. Thus, instructors must deliberately facilitate pre- and post- instructor-learner interactions by tweaking the learning environment and learning activities to simulate them.

Computer-mediated technologies include many features and provide users with numerous settings and configurations that instructors can adapt for online teaching. Moreover, these technologies can mitigate transactional and physical distances and facilitate social and physical presence in instructor-learner interactions. Many collaboration software applications were not explicitly designed for online teaching; however, they have features that facilitate group interaction in a virtual environment. Thus, instructors must take the time to master the technology and determine how best they can leverage the technology features to facilitate learning activities that promote pre- and post- instructor-learner interactions. Furthermore, instructors should understand the limitations of computer-mediated communications and devise alternative ways to overcome them.

One cannot easily simulate pre- and post- instructor-learner interactions in an asynchronous online learning environment because they lack a set time for class meetings. Instructors cannot easily provide instant feedback. Instructor-learner interactions become more critical when instructors deliver technical courses asynchronously. However, one cannot easily simulate pre- and post- instructor-learner interactions in learning environments that lack immediacy and social presence.

Although online classes do not have set meeting times, instructors usually organize and structure them using learning modules or topics. Instructors can design learning activities with comparable outcomes to pre- and post- instructor-learner interactions. In our experience, we acknowledged the challenges of pre- and post- instructor-learner interactions in online courses and created discussion forums and FAQs to simulate pre- and post- instructor-learner interactions.

Discussion forums constitute useful learning activities that can encourage and promote pre- and post- instructor-learner interactions. Instructors can insert these discussion forums into learners' experience can at the end and/or beginning of each learning module and can engage students by providing feedback. Instructors can use the comments and discussions in the forums to gauge students' progress. Furthermore, discussion forums are more inclusive than the pre- and post- instructor-learner interactions in F2F classes because they allow all learners to express themselves. These learning activities encourage

learner-content, learner-leaner, and learner-instructor interactions. Additionally, these discussion forums expose learners to different viewpoints and perspectives.

Regardless of the mode of delivery, pre- and post- instructor-learner interactions play a critical role in learning, especially in technical courses that require significant hands-on exercises. Thus, we believe that pre- and post- instructor-learner interactions provide much value. Hence, instructors should evaluate their learning environments and tools at their disposal and design learning activities that encourage pre- and post-learner-instructor interactions.

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